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Diodes Incorporated
ZXTD09N50DE6TA

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sales@integrated-circuit.com

Lead-free Green

A Product Line of
Diodes Incorporated

ZXTD09N50DE6

50V DUAL NPN LOW SATURATION SWITCHING TRANSISTOR IN SOT26

Features

- BV_{CEO} > 50V
- I_C = 1A High Continuous Current
- High Gain
- R_{SAT} = 160mΩ for Low Equivalent On Resistance
- Low Saturation Voltage $V_{CE(sat)}$ < -270mV @ 1A
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

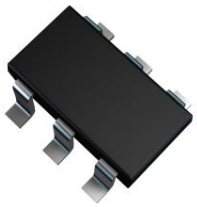
Mechanical Data

- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.015 grams (Approximate)

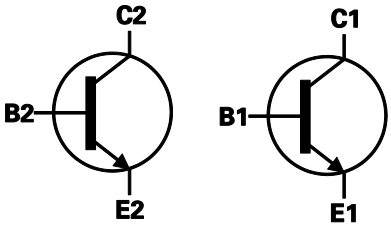
Applications

- LCD Backlighting Inverter Circuits
- Boost Functions in DC-DC Converters

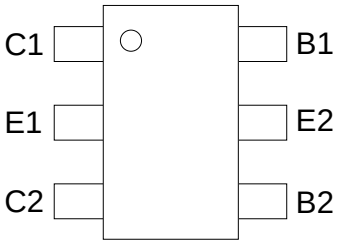
SOT26



Top View



Device Symbol



Top View
Pin-Out

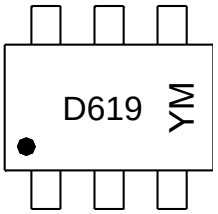
Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTD09N50DE6TA	AEC-Q101	D619	7	8	3,000
ZTD09N50DE6QTA	Automotive	D619	7	8	3,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Automotive products are AEC-Q101 qualified and PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

SOT26



D619 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: C = 2015)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Code	C	D	E	F	G	H	I	J	K	L	M

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Absolute Maximum Ratings – Q1 & Q2 Common (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	1	A
Peak Pulse Current	I_{CM}	2	A
Base Current	I_B	200	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

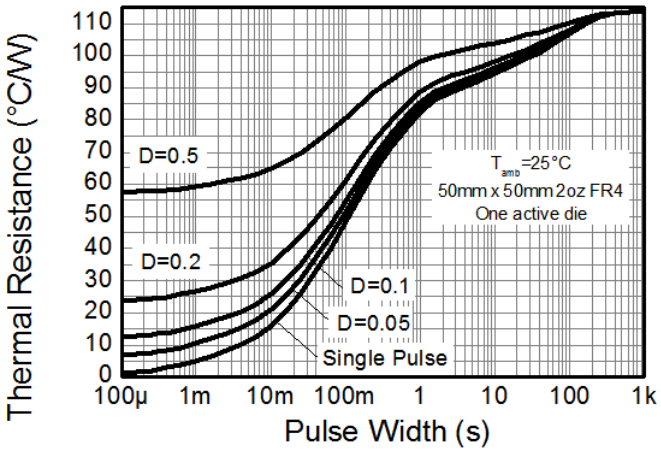
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 6 & 10)	P_D	0.7 5.6	W mW/°C
	(Notes 7 & 10)		0.9 7.2	
	(Notes 7 & 11)		1.1 8.8	
	(Notes 8 & 10)		1.1 8.8	
	(Notes 9 & 10)		1.7 13.6	
Thermal Resistance, Junction to Ambient	(Notes 6 & 10)	$R_{\theta JA}$	179	°C/W
	(Notes 7 & 10)		139	
	(Notes 7 & 11)		113	
	(Notes 8 & 10)		113	
	(Notes 9 & 10)		73	
Thermal Resistance, Junction to Lead	(Note 12)	$R_{\theta JL}$	95.50	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 13)

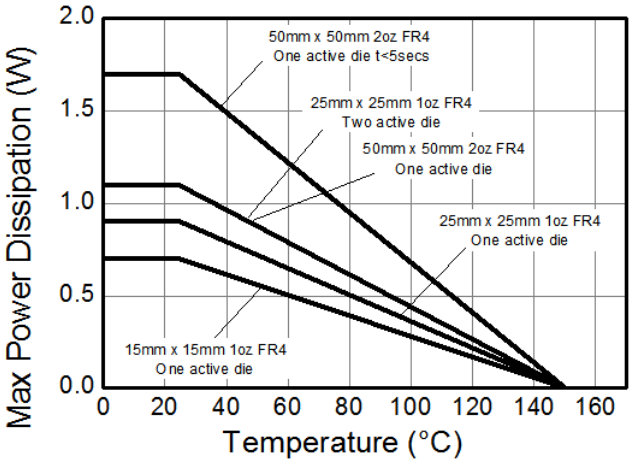
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device surface mounted on 15mm x 15mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
7. Same as Note 6, except the device is surface mounted on 25mm x 25mm 1oz copper.
8. Same as Note 6, except the device is surface mounted on 50mm x 50mm 2oz copper.
9. Same as Note 8, except the device is measured at t < 5 seconds.
10. For device with one active die, both collectors attached to a common heatsink.
11. For device with two active dice running at equal power, split heatsink 50% to each collector.
12. Thermal resistance from junction to solder-point (at the end of the collector lead).
13. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

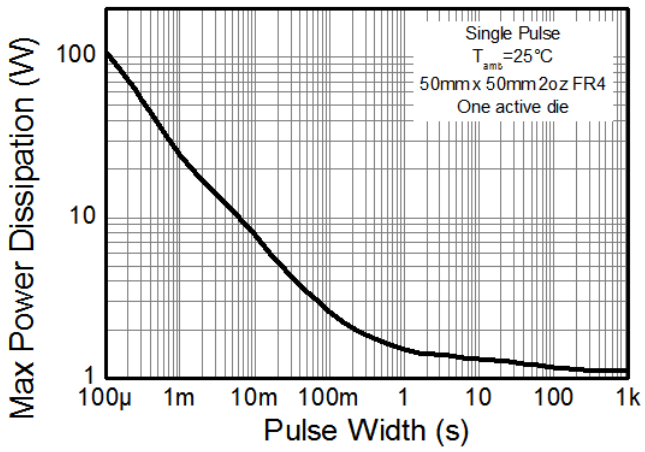
Thermal Characteristics and Derating Information



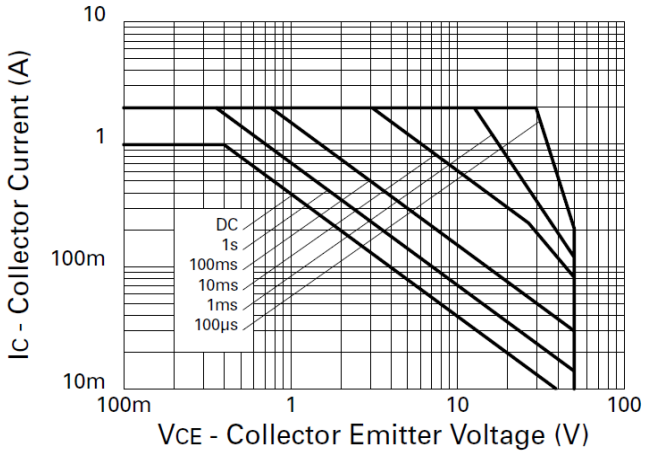
Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation



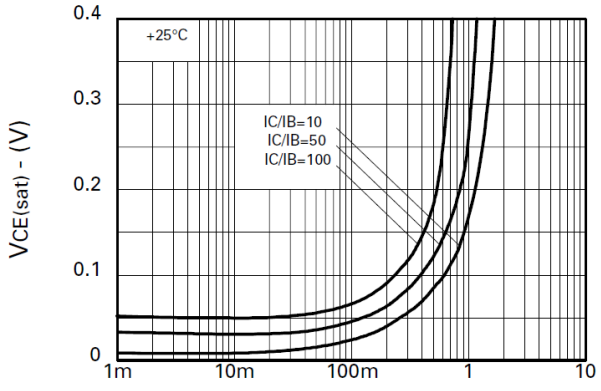
Safe Operating Area

Electrical Characteristics - Q1 & Q2 common (@T_A = +25°C, unless otherwise specified.)

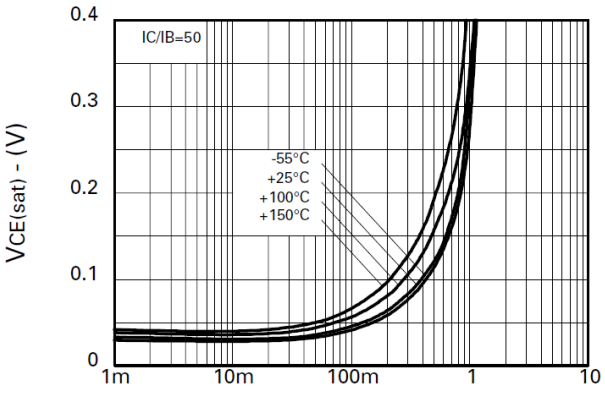
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 13)	BV_{CEO}	50	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100µA
Collector-Base Cut-Off Current	I_{CBO}	—	—	10	nA	V_{CB} = 40V
Collector-Emitter Cut-Off Current	I_{CES}	—	—	10	nA	V_{CES} = 40V
Emitter Cutoff Current	I_{EBO}	—	—	10	nA	V_{EB} = 5.6V
DC Current Gain (Note 13)	h_{FE}	200 300 200 75 20	420 450 350 130 60	—	—	I_C = 10mA, V_{CE} = 2V I_C = 100mA, V_{CE} = 2V I_C = 500mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 1.5A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 13)	$V_{CE(sat)}$	—	24 60 120 160	35 80 200 270	mV	I_C = 100mA, I_B = 10mA I_C = 250mA, I_B = 10mA I_C = 500mA, I_B = 10mA I_C = 1A, I_B = 50mA
Base-Emitter Saturation Voltage (Note 13)	$V_{BE(sat)}$	—	940	1100	mV	I_C = 1A, I_B = 50mA
Base-Emitter Turn-On Voltage (Note 13)	$V_{BE(on)}$	—	850	1100	mV	I_C = 1A, V_{CE} = 2V
Output Capacitance	C_{obo}	—	10	—	pF	V_{CB} = 10V. f = 1MHz
Current Gain-Bandwidth Product	f_T	—	215	—	MHz	V_{CE} = 10V, I_C = 50mA f = 100MHz
Turn-On Time	t_{on}	—	150	—	ns	V_{CC} = 10V, I_C = 1A
Turn-Off Time	t_{off}	—	425	—	ns	I_{B1} = I_{B2} = 100mA

Note: 13. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%.

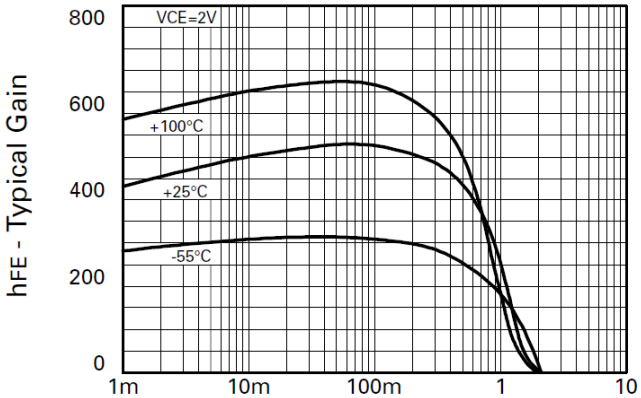
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



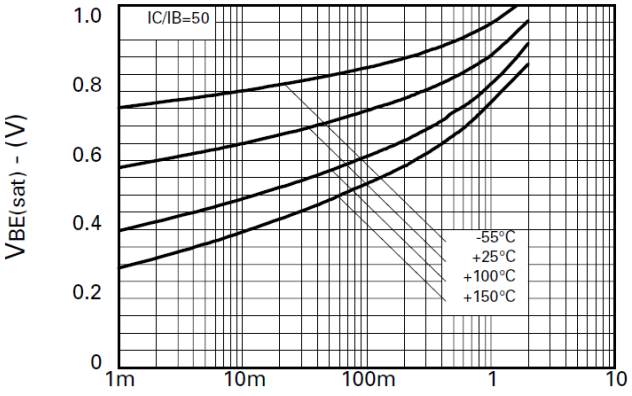
VCE(sat) v IC



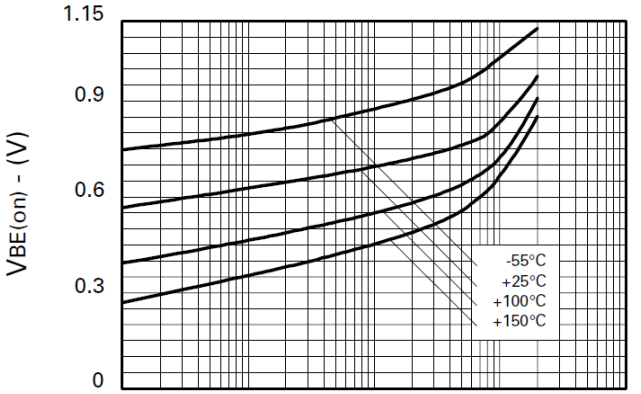
VCE(sat) v IC



hFE v IC



VBE(sat) v IC



VBE(on) v IC

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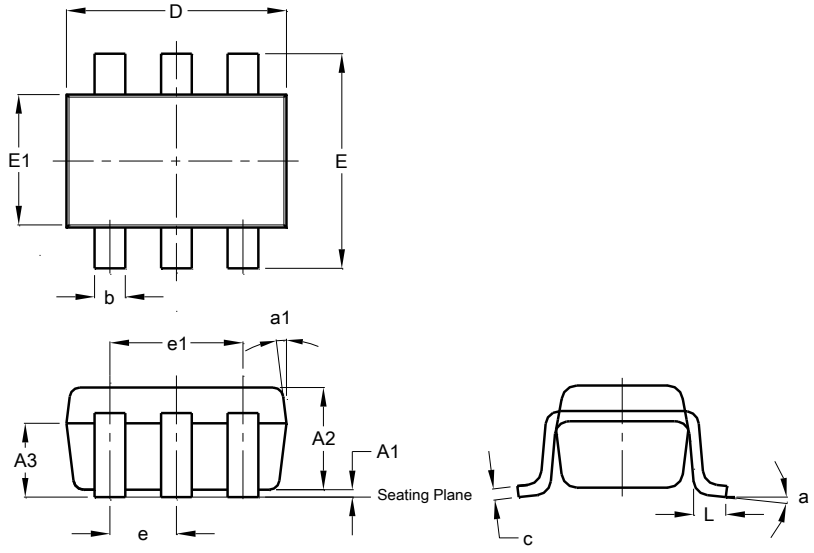
Package Outline Dimensions

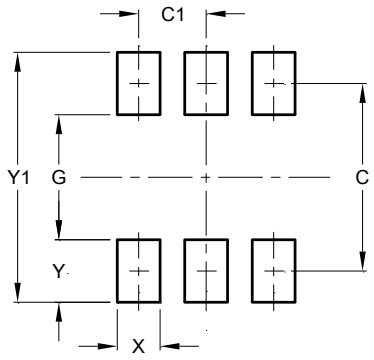
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT26			
Dim	**Min**	**Max**	**Typ**
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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